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EXAMINER

D AGOSTA, STEPHEN M

ART UNIT PAPER NUMBER

2683

DATE MAILED: 07/30/2003

15

Please find below and/or attached an Office communication concerning this application or proceeding.

10

Office Action Summary

Application No.

09/545,872

Applicant(s)

MULLER, WALTER G.A.

Examiner

Stephen M. D'Agosta

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 36-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-21, 37-52, 54-83 and 85-91 is/are rejected.
- 7) ☒ Claim(s) 5, 18, 92, 93 and 843 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 1.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-21 and 36-93 have been considered but are moot in view of the new ground(s) of rejection.

1. Claims 22-35 were cancelled.
2. New claims 67 to 93 have been added.
3. The examiner has added new prior art, Tiedemann et al. US 5,999,816

which discusses CDMA inter-frequency hand-off.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). *The term "virtual active set of base stations" in claims 1, 36, 65, 67 and 88 is unknown. Can the user provide sufficient evidence regarding use of the term in industry, eg. is it used in a standard? Does it really equate to Neighbor and/or Candidate Base Stations?* The term is indefinite because the specification does not clearly redefine the term.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17, 19-20, 37-52, 54-55, 57-83, 85-86 and 88-91 rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver Jr. et al. U.S. Patent 5,848,063 and further in view of Kumar et al. U.S. Patent 6,097,954 and Tiedemann et al. US 5,999,816 (hereafter Weaver, Kumar and Tiedemann).

As per **claims 1, 22 and 36 and 65 and 88**, Weaver teaches a telecommunications network wherein a user equipment unit (UE), using one of a cell or a current active set of base stations on a first frequency (eg. Active Set, C13, L46-50), makes frequency measurements made at the user equipment unit (UE) so warrant (C13, L56-67 – remote unit stores Active/Neighbor/Candidate lists and makes measurements),

(claim 22 only) and wherein the virtual active set of base stations on the second frequency is maintained by a second operator which differs from a first operator which maintains the current active set of base stations on the first frequency. [C7, L61-66].

But is silent on:

(claim 20/22) whereby the user equipment unit (UE) can switch to the virtual active set of base stations.

maintains a virtual active set of base stations on a second frequency (eg. Neighbor and Candidate Sets, C13, L50-55), and performs a measurement respecting a signal on the second frequency for the base stations of the virtual active set.

The examiner notes:

a. Weaver discusses hard/soft handoffs using different frequencies (figures 9, C25, L4-34 AND figure 10 and 14, C25, L63-67 to C26, L1-67). Since Weaver discloses the use of different frequencies (ie. f1 and f2), the examiner broadly interprets this as reading on the applicant's claims.

b. that while Weaver devotes considerable teachings regarding handoffs within one system, his invention further allows the ability to handoff a user from one cell system to a second, different cell system. Hence, much of his teachings focus on pilot signal measurements and not voice channel SNR/RSSI

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measurements. This is because one skilled in the art knows that a cellular system can handover a call if the voice channel SNR/RSSI falls below a certain level (not due to the user roaming near a cell boundary) but for other reasons (ie. going into a building, moving behind a building, moving near a source of RF interference, etc.). Measurements taken regarding these situations would also warrant a handoff as well [C1, L53-67].

Since Weaver also teaches the ability to handoff between both intra-network and inter-network, the mobile unit will have to keep track of the different sets of frequencies available for each possible handoff scenario (C20, L34-45, C9, L7-9 and C24, L44-53).

Kumar teaches the mobile unit being able to receive a message from the candidate Base Station (abstract) – candidate being part of the Candidate Set.

-- Note figure 8, step #720 states that the call processor sends copies of a HD message to active set BTS's and the candidate BTS's which proves that the candidate is not contained in the active BTS set.

Kumar also teaches a soft handoff process whereby a connection is made to the candidate base station (C5, L38-41), which parallels a virtual active set since it is not part of the active set. This teaching can be modified to also include multiple candidate base stations (eg. encompass the entire Neighbor or Candidate list of base stations).

Tiedemann teaches a CDMA handoff that uses the same or different frequencies (C2, L1-33. specifically L6-16) AND knowledge of base stations from a second system prior to handoff via BTS message (C3, L18-45) which reads on virtual base stations.

With further regard to claim 65, Weaver is silent on a message from the network. Tiedemann teaches a message sent from the network/BTS to the mobile (C3, L18-35).

With further regard to claim 88, Weaver is silent on a third frequency. Tiedemann teaches a second frequency and hence, the examiner interprets Tiedemann as teaches one or more frequencies, which reads on the claim.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the user equipment unit (UE) can switch to the virtual active set of base stations, to provide a means for the mobile unit to connect to a second group/set of base stations within the local area.

As per **claims 2 and 37 and 68**, Weaver teaches the network apparatus of claim 1 and 36, wherein the frequency measurements made at the user equipment unit (UE) are triggered periodically or immediately and/or in response to a predetermined event (ie. measure pilot and voice channel RF links for SNR/RSSI periodically as the user roams and a change is triggered immediately based on the event that the measurements fall below a predefined threshold – C13, L58-60).

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As per **claims 3 and 38 and 69**, Weaver teaches the network apparatus of claim 1 and 36, but is silent on wherein in response to a measurement trigger criteria, the user equipment unit (UE) performs and reports inter-frequency measurements for the second frequency.

Weaver does teach measurement/reporting (C14, L12-23).

Tiedeman teaches both same and two different frequencies being used/measured for inter-system or inter-frequency handoff (C2, L1-16).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that second frequency is used, to provide means for inter-frequency handoff.

As per **claims 4 and 39 and 70**, Weaver teaches the network apparatus of claim 3 and 38, the measurement trigger criteria which causes the user equipment unit (UE) to perform and report inter-frequency measurements for the second frequency is the same criteria which is employed to cause the user equipment unit (UE) to perform and report intra-frequency measurements for the first frequency (C14, L12-23 teaches same measuring process for Active, Neighbor and Candidate base stations).

As per **claims 5 and 40 and 71**, Weaver teaches the network apparatus of claim 3 and 38, wherein the measurement trigger criteria is one of being periodically, immediate, or in response to a predetermined event (ie. measure pilot and voice channel RF links for SNR/RSSI periodically as the user roams and a change is triggered immediately based on the event that the measurements fall below a predefined threshold – C13, L58-60).

As per **claims 6 and 41 and 72**, Weaver teaches the network, a telecommunications network wherein a user equipment unit, while using one of a cell or a current active set of base stations on a first frequency, wherein when the frequency measurements made at the user equipment unit (UE) so warrants, the network issues an inter-frequency handover command to the user equipment unit (UE) that the user equipment unit (UE) switches to the virtual active set of base stations (C20, L34-45 shows intersystem CDMA-to-different frequency CDMA handoff which requires inter-frequency handover command to the user terminal)

But is silent on maintains a virtual active set of plural base stations on a second frequency and performs measurements respecting signals on the second frequency for the respective plural base stations of the virtual active set.

Tiedemann teaches a CDMA handoff that uses the same or different frequencies (C2, L1-33. specifically L6-16) AND knowledge of base stations from a second system prior to handoff via BTS message (C3, L18-45) which reads on virtual base stations.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the user equipment unit (UE) can switch to the virtual active set of base stations, to provide a means for the mobile unit to connect to a second group/set of base stations within the local area.

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As per **claims 7 and 42 and 73**, Weaver teaches the network of claim 46 and 36 41, **but is silent on** wherein the network provides information regarding the virtual active set of base stations on the second frequency in a measurement control message.

Weaver does allude to the fact that a hard handoff between two different systems will require the mobile unit to change frequency (C9, L7-9). One skilled in the art would understand that the mobile unit must be able to operate within both systems' frequency ranges and receive control information on differing frequencies (eg. handoff/pilot measurement system data from the AMPS network and similar data on a different frequency from the CDMA network).

Kumar teaches the mobile unit being able to receive a message from the candidate Base Station (abstract) – which one skilled in the art would interpret as being on a second frequency that is different from the frequency connecting the unit to the primary base station.

Tiedemann teaches the network sending a message to the mobile containing technical data (C3, L18-65).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the network provides information regarding the virtual active set of base stations on the second frequency in a measurement control message, to provide an alternate communications channel/frequency upon which to communicate handover information on.

As per **claims 8 and 43 and 74**, Weaver teaches the network of claim 7 and 42, **but is silent on** wherein the measurement control message is included in a DCCH control channel.

One skilled in the art realizes that the DCCH is used to send control data to/from the mobile unit and would be among the choices of ways in which to communicate data between the mobile unit and the cellular network.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, wherein the measurement control message is included in a DCCH control channel, to take advantage of the DCCH communications channel for information conveyance and not require a separate communications means.

As per **claims 9 and 44 and 75**, Weaver teaches the network of claim 7 and 42, wherein the measurement control message further includes one of a measurement parameter to be measured (eg. measurement of the pilot, C13, L56-60) and a predetermined measurement event which triggers a measurement (C13, L60-67).

As per **claims 10 and 45 and 76**, Weaver teaches the network of claim 46 and 36, but is silent on wherein the network provides at least one member of the virtual active set of base stations on the second frequency in a virtual active set update procedure.

Weaver does teach sending active set data (C14, L4-7).

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Tiedemann teaches use of same or different frequencies for inter-frequency handoff and a message from the network (C2, L1-33 and C3, L18-45).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the network provide virtual active set data on second frequency, to provide means for the mobile to understand which base station(s) they can handoff to.

As per **claims 11 and 46 and 77**, Weaver teaches claim 1/36, **but is silent on** the UE receives from the network a message that allows the UE to autonomously update the virtual set of BTS's.

Tiedemann teaches the network/BTS's sending a message to the mobile containing a rough estimate of BTS's the mobile may handoff to (C3, L18-35).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that a message is sent from the network, to provide means for the network to inform the mobile of BTS's in the area that can support a handoff.

As per **claims 12 and 47 and 66 and 78**, Weaver teaches claim 11/46/65, **but is silent on** the message specifies an event or parameter that can trigger the update without the UE having to send a measurement report of the network.

Tiedemann teaches the network/BTS's sending a message to the mobile containing a rough estimate of BTS's the mobile may handoff to (C3, L18-35) and various parameters including minimum total received power (or pilot) threshold.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that a message is sent from the network, to provide means for the network to inform the mobile of BTS's in the area that can support a handoff along with technical parameters.

As per **claims 13 and 48 and 79 and 89**, Weaver teaches the network of claim 46 and 36 41, **but is silent on** wherein the virtual active set of base stations on the second frequency is maintained by a second operator (eg. 2nd cellular system) which differs from a first operator which maintains the current active set of base stations on the first frequency (eg. 1st cellular system).

Weaver teaches multiple cellular systems for handoff [C7, L61-66].

Tiedemann teaches use of same or different frequencies for inter-frequency handoff and a message from the network (C2, L1-33 and C3, L18-45).

With further regard to claim 89, Tiedemann teaches use of more than one frequency, which reads on a third frequency.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the multiple systems are supported, to provide means for the mobile to understand which cellular system they can handoff to.

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As per **claims 14 and 49 and 80 and 90**, Weaver teaches the network of claim 4 6 and 36 41, but is silent on wherein the virtual active set of base stations on the second frequency comprises a second network system which differs from a first network system provided on the first frequency.

Weaver teaches support for different cellular systems. [C7, L61-66 and C20, L39-40 teaches CDMA-to-AMPS handoff which differ in frequencies used].

Tiedemann teaches use of same or different frequencies for inter-frequency handoff and a message from the network (C2, L1-33 and C3, L18-45).

With further regard to claim 90, Tiedemann teaches use of more than one frequency, which reads on a third frequency.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the multiple systems are supported, to provide means for the mobile to understand which cellular system they can handoff to.

As per **claims 15 and 51 and 81 and 91**, Weaver teaches the network of claim 14 and 49, **but is silent on** wherein the second network system is universal mobile telecommunications (UMTS) and the first network system is a Global System for Mobile (GSM) system (**AND OR VICE VERSA**).

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40).

Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS and GSM would be candidate systems.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the second network system is universal mobile telecommunications (UMTS) and the first network system is a Global System for Mobile (GSM) system, to provide a means for handing off between various communications systems.

As per **claims 16 and 50 and 82**, Weaver teaches the network of claim 14 and 49, wherein the second network system is a system having soft intra-frequency handover (C7, L43-45 and C20, L44-45) **but is silent on** and the first network system is universal mobile telecommunications (UMTS).

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40).

Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS would be a candidate system.

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It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one of the network systems is UMTS, to provide a means for handing off to several different communications networks.

As per **claims 17 and 52 and 83**, Weaver teaches the network of claim ~~64~~ and ~~36~~ 41, wherein the network utilizes a frequency quality estimate (eg. measurement of base station pilot signals, C13, L58-67) to determine when ~~frequency measurements made at the user equipment unit (UE) warrant the to~~ switch to the virtual active set of base stations.

Note that the voice channel SNR/RSSI is also monitored, although Weaver does not focus on this facet, and a handoff will occur if a threshold is exceeded.

As per **claims 19 and 54 and 85**, Weaver is silent on use of RSSI and whether BTSC/BSIC has been confirmed or not.

Tiedemann teaches sending a message to the mobile containing neighboring base stations (eg. would include BTS/BSIC data) and power/pilot threshold information which reads on the claim.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that RSSI and BTSC/BSIC data is sent, to provide means for measurement data for each neighboring BTS to be used/known.

As per **claims 20 and 55 and 86**, Weaver teaches the network of claim 17 and 52, wherein the network compares the frequency quality estimate to at least one threshold to determine when ~~frequency measurements made at the user equipment unit (UE) warrant the to~~ switch to the virtual active set of base stations (C13, L60-62).

As per **claim 57, 59, 61 and 63**, Weaver teaches claim 1/11/28/36 wherein the signal for which the UE performs the measurement is a physical control channel on the second frequency (eg. Neighbor and Candidate Sets, C13, L50-55, performs a measurement respecting a signal on the second frequency for the base stations of the virtual active set. Weaver discusses hard/soft handoffs using different frequencies (figures 9, C25, L4-34 AND figure 10 and 14, C25, L63-67 to C26, L1-67). Since Weaver discloses the use of different frequencies (ie. f1 and f2), the examiner broadly interprets this as reading on the applicant's claims. Weaver teaches measurements made at the user equipment unit (UE) (C13, L56-67 – remote unit stores Active/Neighbor/Candidate lists and makes measurements).

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As per claim 58, 60, 62 and 64, Weaver teaches claim 1/22/28/36 wherein the cells which belong to the virtual active set on the second frequency are cells which would be considered in the active set on the second frequency if the UE were to use the second frequency for active traffic (eg. Neighbor and Candidate Sets, C13, L50-55, performs a measurement respecting a signal on the second frequency for the base stations of the virtual active set. Weaver discusses hard/soft handoffs using different frequencies (figures 9, C25, L4-34 AND figure 10 and 14, C25, L63-67 to C26, L1-67). Since Weaver discloses the use of different frequencies (ie. f1 and f2), the examiner broadly interprets this as reading on the applicant's claims. Weaver teaches measurements made at the user equipment unit (UE) (C13, L56-67 – remote unit stores Active/Neighbor/Candidate lists and makes measurements).

Claims 21, 27, 33 and 56 and 87 rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver/Kumar/Tiedemann and further in view of Bringby et al. U.S. Patent 6,285,883 (hereafter referred to as Bringby).

As per claims 21 and 56 and 87, Weaver teaches the network of claim 20 and 21, **but is silent on** wherein the at least one threshold is chosen to provide hysteresis protection.

Bringby teaches the concept of adaptive handoff hysteresis in a wireless network (title) in order to reduce (eg. protect against) the rate of oscillating handoffs from a routine mobile handoff during roaming (abstract). Received signal strength measurements are made in the originating cell and in at least one neighboring cell (abstract). This concept parallels the applicant's use of hysteresis.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one threshold is chosen to provide hysteresis protection, to stop/protect an oscillating back and forth between communications systems as user moves/roams.

Allowable Subject Matter

Claims 18, 53, 84 and 92-93 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18, 53, 84 and 92-93: The network wherein the frequency quality estimate is provided by Equation 1. ***Weaver does not teach an equation such as that provided by the applicant in the specification.***

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


1. Czaja et al. US 6,078,570 teaches hard handoff for CDMA system.
2. Tiedemann et al. US 6,304,755 teaches MAHO hard handoff.
3. Huang et al. US 6,590,879 teaches CDMA handoff.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

SMD
July 22, 2003


WILLIAM TROST
SUPERVISORY PATENT EXAMINER
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